

splash!

quick facts on...

Stormwater Treatment Areas

FEBRUARY 20, 2004

The South Florida Water Management District

is a regional, governmental agency that oversees the water resources in the southern half of the state. It is the oldest and largest of the state's five water management districts.

Our Mission is to manage and protect water resources of the region by balancing and improving water quality, flood control, natural systems, and water supply.

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The Everglades is naturally a low-nutrient ecosystem. Native wetland plants thrive there on very small amounts of nitrogen, phosphorus and other nutrients. Wading birds, fish, and other animals living in the Everglades depend on these plants for survival.

During the past century, population growth in South Florida altered the Everglades environment in many ways. Wetlands were drained to create dry land for farms and homes, reducing the size of the Everglades by half. Canals, levees, and pumps provided flood protection and enhanced municipal supplies, redirecting water that once flowed south toward Florida Bay. On farmlands just to the north and in urban areas to the east, pesticides and fertilizers improved crop growth and controlled insects—but some substances found their way into pristine Everglades waters, with undesirable results.

Scientists determined that phosphorus, a vital part of all natural systems and a component in many fertilizers, has put the fragile Everglades environment at risk. Excess phosphorus, found in stormwater runoff from agricultural, residential and urban areas, eventually reaches the Everglades. There it promotes algae growth and an overabundance of undesirable plants, which crowd out natural vegetation. These changes harm the marsh ecosystem.

Phosphorus Removal Options

As guardian of South Florida's water resources, the South Florida Water Management District has studied many options for removing phosphorus before it reaches the Everglades. One successful step has been to modify farming and landscaping practices, which reduces the amount of nutrients that end up in stormwater runoff.

These best management practices, or BMPs, have prevented over 1,100 tons of phosphorus from entering the Everglades over the last ten years.

Another step harnesses nature to do much of the work. By creating specialized wetlands at key sites along the northern edge of the Everglades Protection Area, the District can treat agricultural and urban runoff before it flows into the Everglades. These constructed wetlands, called Stormwater Treatment Areas, or STAs, are an essential component in protecting the Everglades environment.



Dirt and rock are removed to build canals and levees in Stormwater Treatment Areas.

How Do Stormwater Treatment Areas Work?

When water flows through a wetland, plants (including tiny algae) can absorb substances from the water, using them in life processes or storing them in their tissues. Constructed wetlands planted with certain types of vegetation in a certain sequence can remove phosphorus very efficiently.

As water enters an Everglades Stormwater Treatment Area, it first flows into a cattail marsh. Cattail is one of the most effective aquatic plants at lowering phosphorus levels. The more phosphorus cattail takes in, the denser it grows. Farther along in the STA, submerged plants, such as hyacinth and southern naiad, plus algae that attach to the plants' underwater stems remove additional phosphorus, bringing the concentration down to very low levels.

Even after plants in the Stormwater Treatment Area die, they are still at work. Leaf decomposition helps form sediments in the wetland bottom. Cattail roots readily absorb phosphorus from these sediments, producing yet more leaves. Finally, the limestone layer beneath the sediment absorbs and holds phosphorus, providing many decades of phosphorus "storage."

Are Stormwater Treatment Areas Effective?

Without a doubt. Research efforts and pilot projects have confirmed the outstanding results of this **green technology**. To meet required water quality targets, the South Florida Water Management District has constructed five treatment wetlands in Palm Beach and Hendry counties. The U.S. Army Corps of Engineers is constructing another STA in central Palm Beach County. Together they provide more than 40,000 acres of treatment area. Four of the STAs are fully operational and have removed 340 metric tons

of phosphorus from stormwater runoff over the last ten years. Combined with best management practices, more than 1,400 metric tons of phosphorus have been prevented from reaching the Everglades.

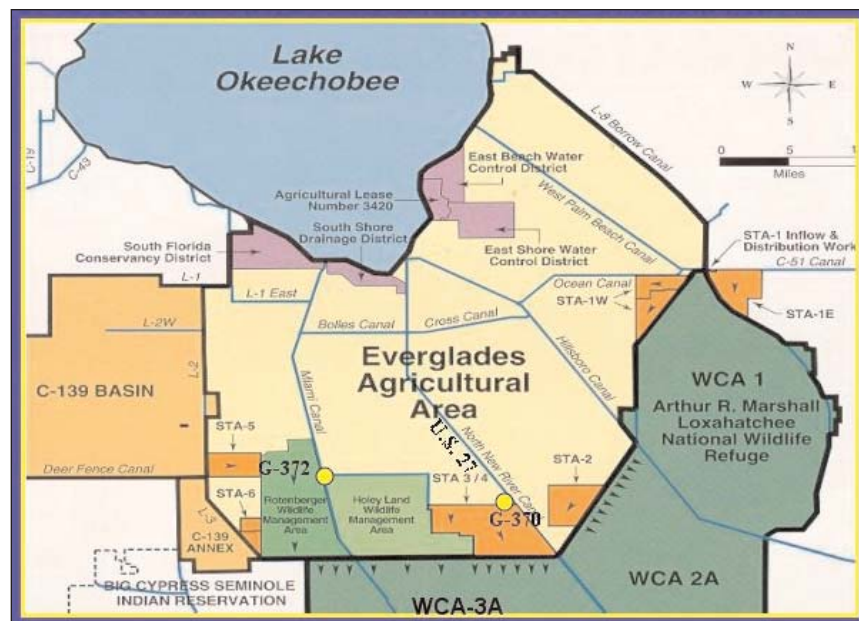
STA-3/4: the World's Largest Stormwater Treatment Area

The District's newest Stormwater Treatment Area is STA-3/4, located along the Palm Beach-Broward county line. Covering 26 square miles, it is the largest constructed wetland in the world. Initial start-up operations on approximately 10,000 acres were underway by October 1, 2003. Initial flow-through operation began in February 2004.

During an average year, STA-3/4 will receive about 350,000 acre-feet of water from agricultural stormwater runoff and another 250,000 acre-feet of Lake Okeechobee releases. It will not only improve water quality but will provide enormous water storage capabilities, reducing the need for Lake Okeechobee discharges into South Florida's fragile estuaries.

Ongoing studies are helping to improve STA performance, and enhancements to structures and vegetation are underway. When final construction is complete in 2006, this treatment wetland alone will remove more than 55 metric tons of phosphorus each year, preventing vast amounts of this substance from ever reaching Everglades waters.

Stormwater Treatment Areas Location Map



Stormwater Treatment Area 3/4 is enormous – 26 square miles in size. It will remove over 40 tons of phosphorus each year.



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